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10/765,517	01/27/2004	Ulrich Bonne	H0006233-0760(1100.124410	1022

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EXAMINER
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BERTHEAUD, PETER JOHN

ART UNIT	PAPER NUMBER
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3746

MAIL DATE	DELIVERY MODE
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08/06/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/765,517	<b>Applicant(s)</b> BONNE, ULRICH	
	<b>Examiner</b> Peter J. Bertheaud	<b>Art Unit</b> 3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 22 June 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-30 and 36-54 is/are pending in the application.
- 4a) Of the above claim(s) 31-35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 9-14, 16, 17, 19, 20, 22-30 and 36-54 is/are rejected.
- 7) ☒ Claim(s) 6-8, 15, 18 and 21 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>10/12/04</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. This office action is in response to the amendments of 6/22/2007. It is noted that claims 1, 3, 5, 6, 10-13, 17, 25, 42, and 53 have been amended and claims 31-35 have been withdrawn.

#### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 53-54 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 53 has been amended to include the phrase "wherein the openings in the first conductive layer at the first discharge device electrodes have a sharp point". However, after looking at the Figures, the openings in the first conductive layer are very wide at their mouth and then narrow before the insulating layer 36, they do not seem to have a sharp-point.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 50-54 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In Claim 50, the phrase "A means for ion pumping,

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comprising: means for providing an electrical discharge; means for enclosing the means for providing an electrical discharge" is indefinite. This "means" could all be the same element or could be referring to different elements; therefore, it does not distinctly claim the subject matter of the invention. Claim 53 has been amended to include the phrase "wherein the openings in the first conductive layer at the first discharge device electrodes have a sharp point". However, how does an opening have a sharp point? An opening is a space that is void so as to let something pass through. Examiner believes that an opening may come to a point, but it is found indefinite to state that an opening has a sharp-point.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-5, 9-12, 14, 16, 17, 20, 22-30, and 36-41 are rejected under 35 U.S.C. 102(b) as being anticipated by Reader 3,554,669.

Reader discloses an electric-fluid energy converter comprising a flow channel 16, 20, a non-conducting insulating layer 24; a first conductive layer or material 12 situated on a first side of the insulating layer; a second conductive layer or material 14 situated on a second side of the insulating layer 24; the first conductive layer or material has a prominent like contour 18 or projection into the channel 18; a plurality of openings 16,

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20 situated in the first conductive layer 12, the insulating layer 24 and the second conductive layer 14 forming channels having first 18 and second 20 discharge device electrodes, wherein the plurality of openings are grouped into inputs and outputs, and the openings situated at inputs are sharp-like conductor openings and the openings situated at outputs are non-sharp-like conductor openings (see how the openings are more narrow at their inlets than at the exits because of the pointed ends, therefore the openings 16,20 are more "sharp" at their inlets as claimed); the first and second discharge device electrodes, energized by a voltage, provide an electrical discharge (see col. 3, lines 4-5); and an enclosure 26, 28 containing the channels and having an input port proximate to an input side of the plurality of openings and an output port proximate to an output side of the plurality of openings (see col. 1, lines 20-24). Reader also discloses that the fluid in the enclosure can be transported between the input port and the output port by being forced through the plurality of openings (see col. 1, lines 20-24). Reader further discloses that a flow direction of the flow channel is approximately parallel to the elongated dimension through the non-conducting spacer material 24, and proceeding from a prominent conductive material or projection 18 to a non-prominent conductive material 22 through the non-conducting spacer material 24, wherein the conductive materials are electrodes (see col. 2, lines 43-45) forming a discharge device. Reader also discloses that each pumping element of the plurality of pumping elements comprises: a first orifice 16 in a first electrode plate 12; a second orifice 20 in a second electrode plate 14; and a layer of insulating material 24 situated between the first and second electrode plates and having an opening between the first

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and second orifices (see opening provided by 24 in Figs. 1-2B); and wherein the first orifice has a sharp-like contour (front of 18). Reader further discloses that the sharp-like conductor openings and non-sharp-like conductor openings are situated in the first conductive layer, the first discharge electrodes 18 have a configuration to generate in-situ ions proximate to the sharp-like conductor openings; the in-situ ions predominantly have the polarity of the sharp-like conductor openings, which then induce a fluid flow of neutral molecules as a result of a force and viscous drag of the in-situ ions and away from the sharp-like conductor openings. Reader also discloses a plurality of flow channels 16, 20 having the first 12 and second 14 conductive materials; wherein the flow channels form an array in a plane and an axis of each flow channel is approximately perpendicular to the plane (see channel configuration in Figs. 1-2B). Reader further discloses that the first portion of a plurality of channels 16, 20 has the first conductive material 12 on a first side of the plane proximate to the input port and the second conductive material 14 on a second side of the plane proximate to the outlet port (see col. 1, lines 20-24). Reader also discloses that the plurality of openings is grouped into first and second stages (see Fig. 3); the stages are arranged in a flow series. Reader further discloses that the openings situated at inputs of the first and second stages are sharp-like conductor openings 34a, 34b; and the openings situated at outputs of the first and second stages are non-sharp-like conductors 40a, 40b; and the first and second stages are in separate chambers (separated by 44c). Reader also discloses that the first orifice 16 of each pumping element is capable of producing an ionizing corona due to the sharpness of the front end of 18 in reference to 22; this

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creates a higher gradient than elsewhere in the flow channel giving the configuration the potential to provide a corona of ions. Reader further discloses that the sharp-like conductor openings comprise a conductive electrode, thin-film material 12. Reader also discloses that the plurality of openings is fabricated by etching (see col.3, lines 31-34). Reader further discloses that the pump is operated like a valve by adjusting an applied voltage across the first and second discharge device electrodes to oppose and balance an external flow and pressure (see col. 3, lines 4-14).

In reference to claims 16 and 17; while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function, because apparatus claims cover what a device is, not what a device does (*Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990)). Thus, if a prior art structure is capable of performing the intended use as recited in the preamble, or elsewhere in a claim, then it meets the claim, as has been shown above to be the instant case.

### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Reader 3,554,669.

Reader discloses the claimed invention except for the sharp-like conductor openings comprising 10 to 100 nm-thick films and the non-sharp-like openings comprising 100-10,000 nm-thick films of conductive material; and rounded inner diameter edges. It would have been an obvious matter of design choice to make films within these parameters, since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955) (see MPEP 2144.04 – IV Changes in Size, Shape, or Sequence of Adding Ingredients).

10. Claims 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Reader 3,554,669 in view of Fischer 6,583,407.

Reader discloses the invention as discussed above. However, Reader does not teach the following claimed limitations taught by Fischer.

Fischer teaches a method and apparatus for ion delivery comprising a first electrode 20 and a second electrode 22. Fischer further teaches a method for controlling fluid flow with the at least one set of first and second electrodes to achieve pulses of sample analyte into a gas analyzer and/or out of a gas analyzer, the gas analyzer being of gas chromatography (see col. 1, lines 15-25 and col. 9, lines 7-16).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the pump of Reader by moving sample analyte by pulse into a gas analyzer in order to selectively delivery ions that have a wide range of properties (Fischer, col. 1, lines 15-27).



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11. Claims 42-46 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reader 3,554,669 in view of Henoch 6,106,236.

Reader teaches a method providing at least one set of first 12 and second 14 electrodes separated by a distance; containing the at least one set of first and second electrodes in an enclosure 26, 28 having an input and an output; the first electrode 18 being shaped so as to be suitable for providing a corona of ionization due to the sharpness of the front end of 18 in reference to 22; this creates a higher gradient than elsewhere in the flow channel giving the configuration the potential to provide a corona of ions; and applying a DC voltage to the at least one set of first and second electrodes which could result in a corona at the first electrode; and wherein the corona may generate ions to induce a fluid flow in the enclosure (see col. 2, lines 65-72 and col. 3, lines 1-3). Reader further teaches a method comprising completing the at least one set of first 32a and second 40a electrodes to ignite the discharge with a second set of electrodes 32b, 40b that could generate an ion drift. Reader also teaches a method wherein a negative electrode attracts mostly positive and heavy ions, a positive electrode attracts mostly negative ions, generated by an attachment of electrons which is a lower-energy process than a process of removing an electron from a neutral molecule (see col. 2, lines 55-69), and adjusting the voltages to provide valve-like control of the fluid flow (see col. 3, lines 4-14). However, Reader does not teach the following claimed limitations taught by Henoch.

Henoch teaches a fluid conduit comprising a first electrode 12 and a second electrode 14. Henoch further teaches a method for applying and using an AC voltage 16

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to generate ions in an electroless operation and a DC field 24 to accelerate the ions of the fluid in the direction of a desired flow (see col. 2, lines 54-66).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the pump of Reader by using an AC voltage as well as a DC voltage in order to reduce flow friction (Henoch, col. 2, lines 54-66).

12. Claims 47-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reader 3,554,669 in view of Henoch 6,106,236 and in further view of Fischer 6,583,407.

Reader in view of Henoch discloses the invention as discussed above. However, Reader in view of Henoch does not teach the following claimed limitations taught by Fischer.

Fischer teaches a method and apparatus for ion delivery comprising a first electrode 20 and a second electrode 22. Fischer further teaches a method for controlling fluid flow with the at least one set of first and second electrodes to achieve pulses of sample analyte into a gas analyzer and/or out of a gas analyzer, the gas analyzer being of gas chromatography (see col. 1, lines 15-25 and col. 9, lines 7-16).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the pump of Reader in view of Henoch by moving sample analyte by pulse into a gas analyzer in order to selectively delivery ions that have a wide range of properties (Fischer, col. 1, lines 15-27).

***Allowable Subject Matter***

13. Claims 6-8, 15, 18, and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

14. Applicant's arguments, see amendment, filed 6/22/2007, with respect to 35 USC § 112 1<sup>st</sup> paragraph rejection of claims 15, 17, and 18 have been fully considered and are persuasive. The 35 USC § 112 1<sup>st</sup> paragraph rejection of claims 15, 17, and 18 has been withdrawn.

15. Applicant's arguments filed 6/22/2007 have been fully considered but they are not persuasive.

16. In reference to Applicant's argument with respect to claims 50-52: Applicant argues that the use of the term "means" simply broadens the scope of the claims and the subject matter is clear. However, Examiner maintains that the use of "means" in the preamble fails to limit the claim to the limitations written. Therefore it is impossible to determine applicant's invention from this claim. Furthermore, claims 51 and 52 begin with "The means of claim..."; it is unknown as to which means these claims are referring to due to the extensive usage of the term in claim 50.

17. In reference to Applicant's argument with respect to claim 1: Applicant argues that Reader teaches "sharp tips at the output openings, rather than the inputs, as is recited in the claims". However, this is not how the claim reads. Claim 1 states that "the

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plurality of openings are grouped into inputs and outputs, and the openings situated at inputs are sharp-like conductor openings and the openings situated at outputs are non-sharp-like conductor openings". First and foremost these "groups" of inputs and outputs are very poorly defined. Are the inputs and outputs supposed to be the front and back of each the electrode plates? Or, is the input and output supposed to be the front of the first electrode plate and the back of the second electrode plate? Second, the key term here is openings: Figure 2B in Reader shows openings 16,20 that are more narrow at their inlets than at the exits because of the way the pointed ends taper in creating a wider, i.e. less sharp, outlet; therefore, the openings 16,20 are more "sharp" at their inlets as claimed. Examiner maintains that Reader reads on claim 1.

18. In reference to Applicant's argument with respect to claim 22: Applicant argues that Reader teaches a device in which flow is from a rounded opening 16 towards the sharp tip 18a opening and not from a prominent conductive material to a non-prominent conductive material. Applicant is correct in that the flow in Reader is from a rounded opening 16 towards the sharp tip 18a opening; however, Reader still reads on the claim. Reader discloses a flow channel in which the flow proceeds from a prominent conductive material 18 to a non-prominent conductive material 22, wherein the conductive materials are electrodes forming the discharge device, just as the claim reads. Therefore, the flow proceeds to the second electrode 14 not 18a, which is the back end of the first electrode (12), from the first electrode 12. The second electrode 14 has the non-prominent conductive material 22, which is indeed non-prominent as

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compared to the "sharper" 18, which is the prominent-like contour. Examiner maintains that Reader reads on claim 22.

19. In reference to Applicant's argument with respect to claim 25: see Examiner's response to argument with respect to claim 22.

20. In reference to Applicant's argument with respect to claim 36: Applicant argues that Reader appears to teach a sharp tip at 18a at the second opening, rather than a first orifice having a sharp-like contour. Just because its sharp at the rear end of the electrode plate does not mean the front of the orifice is not "sharp-like". Furthermore, the opening at 18a is not in the second electrode plate, it is the end of the first electrode plate, and therefore is not the second orifice. Examiner maintains that Reader discloses that the first orifice has a sharp-like contour, see the front of 18 and opening 16, and thus reads on claim 36.

21. In reference to Applicant's argument with respect to claim 42: see Examiner's response to argument with respect to claim 1.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the


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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter J. Bertheaud whose telephone number is (571) 272-3476. The examiner can normally be reached on M-F 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Stashick can be reached on (571) 272-4561. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
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7/31/07

  
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